RESTRICTED

TROPICAL MEDICINES AND OTHER MEDICAL SUBJECTS IN GERMANY

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COMBINED INTELLIGENCE OBJECTIVES
SUB - COMMITTEE

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Reported by

Dr. J. B. RICE, U.S. Civilian, T.I.I.C.

CIOS Item 24
Medical

COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE
G-2 Division, SHAEF (Rear) APO 413

RESTRICTED

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1. Dr. Albert Herrlich - Munich

Chief Physician - Mariahilfs Krankenhaus
Mariahilfs Platz 15

Staff Physician - University of Munich

MALARIA

Dr. Albert Herrlich used sontochin in two or three hundred cases as associate of Dr. Otto Fischer. He thinks the drug equal to atabrine but not superior either from standpoint of toxicity or activity. As a prophylactic he thinks it identical with atabrine regarding results obtained. The sole advantage is that sontochin does not stain the skin. He believes both atabrine and sontochin are "30 day cures", that is, any case treated with either may relapse after this time.

He believes strongly that plasmochin given following atabrine definitely lowers the relapse rate. He says that of 100 soldiers in one company returned from Sardinia, eighty-five contracted falciparum malaria. All were given the usual course of atabrine but half of them were given in addition 0.03 gm. plasmochin daily for three days. All were kept under observation for one year. He does not have figures but is certain that the relapse rate in the plasmochin group was definitely lower. (Note: relapse rate after falciparum malaria should have been quite low in any case).

He does not know of Badional but he has tested some drugs from the I.G. Farbenindustrie designated by number only. He also tried a preparation made by a Bulgarian manufacturer and recommended by General Rose but found all these preparations worthless.

TRENCH FEVER

Dr. Herrlich knew nothing of xenodiagnosic and relies entirely on clinical findings. He thinks "pyrifen" treatment (artificial fever produced by injecting foreign protein) gives excellent results if injection is made at the time of natural fever - if given during intermission when the patient is asymptomatic he thinks the benefit doubful.

LEISHMANIASIS

Dr. Herrlich has treated about six cases of Kala azar from the Mediterranean area. He says that in Kala azar the normal relationship between serum albumin and serum globulin is reversed and that in Kalaazar there is about twice as much globulin as albumin. He believes that this ratio can be used as a guide in treatment. He advocates giving large doses of solustibosan concentrated (100 mg antimony per cc) and increases the dose until the serum globulin-albumin ratio is restored to 1:2. He thinks that antimony is not likely to cause toxicity as long as the globulin fraction remains high. He gives up to 3.4 cc of concentrated solustibosan daily for seven or eight days.

He will write up his ideas on treatment and send through channels to Col. R. C. Prentiss.

DYSENTERY

Dr. Herrlich believes amoebic dysentery is usually complicated at one time or another with bacillary dysentery. For the treatment of amoebic dysentery he relies on Enterovioform (di-iodoquinoline) 2 gm. daily by mouth; and 1 gm. gradually increased to 2 gm. in 500 cc. of water, by enema. After seven days (total 30 gm sometimes as high as 50 gm) he gives 0.01 gm. emetin subcutaneously for ten days. The relapse rate is low under this form of treatment but he has no figures.

INTESTINAL COCCIDIOSIS

Dr. Herrlich has treated 27 cases of Isospora hominis infection and has transmitted it to himself, his assistants and others. As a result of his studies he believes that the disease undergoes a spontaneous cure at the time the oocysts appear in the stool producing a transcient diarrhoea. He thinks that since the disease produces no symptoms and cannot be diagnosed prior to this time that no treatment for it is necessary. He believes the disease far more common in the Balkans and the East than is suspected.

He claims to know nothing of biologic warfare and thinks it impractical. He says that Professor Dr. Hauer of Berlin (Dahlem-Hosp. No.118 Thiel Allee 1-3) is a fashionable doctor well known in

diplomatic circles and might know whether any exchange of medical information has taken place between Germany and Japan during the war.

2. Professor Otto Fischer

PoW. Hosp. 1753 A. near Augsberg
Controlled by C 5 Med. Group, 3rd Army.

MALARIA

In the past few years Professor Fischer has treated from 500 to 800 cases of vivax malaria, all naturally acquired. They were only observed for three or four weeks so no information is available on relapses. He has not worked on induced malaria. These cases were all treated with sontochin by mouth and injection. For routine use he believes the same dose and method of treatment as used for atabrine is satisfactory. Under these conditions he believes sontochin slightly less active than atabrine and somewhat slower in reducing the fever. With sontochin 0.6 gm. daily the fever is brought to normal on the day following the first dose in both falciparum and vivax malaria. He believes tha t the ideal method of treatment for hospital cases is to give two or three intromuscular injections totalling 0.6 gm. in the first 48 hours followed by 0.3 gm. daily by mouth, for five or six additional days. In July 1943 he had the opportunity of observing about 50 cases of vivax malaria all of whom had relapsed with eight weeks of a full course of atabrine. These cases were from the Eastern front and mainly from Roumania. All patients were given a second course of atabrine followed immediately by a three day course of plasmochin (0.03 gm. daily by mouth). These cases were followed for nearly a year and very few relapsed (exact numbers not known because his records are not available in prison). The first relapse after this treatment was eight weeks after the end of treatment. Because of this and other experiences recently, he now believes that a course of plasmochin following atabrine reduces the relapse rate, although he approached this subject with great scepticism two years ago.

Since 1943, the three day plasmochin course (0.09 gm. total) by mouth has been routine treatment in the Wehrmacht. Many thousands

of cases were treated in this way and the army was gratified at the lowering of the relapse rate in both vivax and falciparum malria , but he does not have the army figures. This dose does not produce methemoglobin (many tests done) or other symptoms of toxicity.

Before this treatment the German army had a surprisingly large number of falciparum relapses. The relapses appeared early, two to six weeks after treatment. He thinks that falciparum malaria seldom lasts longer than two or three months and vivax rarely longer than eighteen months or two years. He also tested a new drug made by Knoll (prep. 2650?) which was a quinine derivative. He thinks it less active than quinine and abandoned his experiments with it. He has had no experience in malaria control or proplylaxis.

AMOEBIC DYSENTERY

Dr. Fischer has treated about 1000 cases in the past few years with di-iodo-quinoline (for technic, see report on Dr. Heerlich) and emetine. He thinks this drug definietely superior to yatren and, if anything, less toxic. With its use he claims to have seen only 12-15 cases of relapses and very few liner abscesses. He has also used di-brom-quinoline (Ciba) in 40-50 cases and finds it as good as, but no better than, di-iodo-quinoline.

RELAPSING FEVER

Dr. Fischer saw about 150 cases from North Africa and found many resistant to neo-arsphenamine. These cases were thought to be transmitted by ticks. Many had complications such as iritis and neuritis. After the first relapse he found marked spinal fluid changes, i.e., increased globulin, increased total protein, and a cell count of from 500 to 700 with increase in mast cells. He believes there is a difference between relapsing fever carried by lice and that thransmitted by ticks. He says that mice can easily be infected with spirochetes of the louse type, but can be infected with tick type only with difficulty. In ten of these cases from North Africa he tried an organic gold preparation "Solganol" made by Schering (pub. by Veldt) in doses of 0.5 cc intraveneously. Only one of the cases relapsed but the number was too few to permit drawing conclusions.

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Other tropical diseases such as tryponosomiasis, typhus cholera, schistosomiasis and leishmaniasis were discussed at some length, but he had nothing of interest to offer.

He was cooperative but the interrogation was handicapped by the fact that his notes and records were not available to him in prison.

3. Dr. Werner Junge

Schulungs und Forschungs Station für Tropenmedizin, Ströbing Hospital (amer.Nr. 1335) - Endorf near Rosenheim.

MALARIA

Dr. Junge formerly Captain in the Wehrmacht is in charge of the "Schulungs und Forschungs Station für Tropenmedizin" at the Ströbing Hospital. He is an able young man who spent ten years in Liberia, West Africa, as a missionary doctor. He told me of the whereabouts of Professor Martini and also of the work of Dr. Albert Westphal on the new unpublished test for latent malaria. Dr. Junge did the clinical work and says that Dr. Westphal's test is remarkably accurate - 90 % perhaps.

Dr. Junge has had some experience with Gix and Geseral. He thinks Gix inferior but the Army had no supplies of Geseral. He used thio-diphenylamine in petrol for spraying on breeding places of anophelines and also calcium arsenites in dust because of the shortage of Paris Green. He thinks neither as good as Paris Green.

Relapsing fever, tropical ulcer, schistosomiasis and other tropical diseases were discussed, but he had nothing new to offer.

4. Professor Dr. Erich Martini

Cage No.9 Bad Aibling Prison Camp.

MALARIA

During most of the war Professor Martini was in Hamburg Institute and at Berlin. He was commissioned a Major (later made Lt. Col.) in the German army. He made short inspection trips to

Albania, the Balkans, Greece and Italy as consultant. The German army found that Paris Green by hand spraying was the best method of larva control - airplane spraying was too wasteful of the scant stocks of P.G. Calcium arsenite was used as a substitute, but it was much less effective than P.G. It was necessary to use from five to ten times as much calcium arsenite as P.G. for the same effect. Oil was used in Albania, because of the abundant supply. Because of short supplies, D.D.T. was used only for killing adult flies. He claims to know little of the subject, but thinks D.D.T. superior for fly control and Lauseto best for lice. Gambusia brought from Athens was doing effective work in larva control in Albania. He says he continued Hackett's work in Durratzio, Albania, in controlling anopheles breeding by sea water. The water gates were opened during the day when the winds tend to blow water in from the sea, making the swamps saline. The gates were closed at night.

At Valoria (South Albania) a similar scheme was tried by the Italians. Pumps were used to drain most of the water off. Where this was impossible pumps were used to bring in sea water. The effort was fairly successful but Dr. Martini thinks the major benefit was derived from drainage in this case.

Regarding the situation which the American army found in the Roman Companya and the Poxtine marshes, Dr. Martini has this to say: Even before the Germans took over, malaria was on the increase because the Italians were neglecting the "bonification" works during war time. When the Germans saw an inevitable retreat in Italy, the High Command ordered the flooding of these places to impede the transport of American Artillery and heavy vehicles, and to hamper the movements of Americans generally. He says that the High Command cared nothing for the effect on malaria. However, Miseroli protested the order and then the High Command sent for Dr. Martini to obtain his opinion as to how the flooding could be done with the least damage from the malaria standpoint.

Miseroli held the opinion that salt water should be used so that no anophelenes could breed in the swamps. Dr. Martini differed. He said that if salt water were used, breeding would be prevented only hear the sea where concentrations of salt were high.

In remote portions of the swamp, however, where the saline would be low, conditions would be ideal for the breeding of A. elutus (the worst malaria vector in Europe, which breeds in brackish water). These conditions would last for years because the

alat would remain in the ground long after drainage. Also the salt would ruin the soil for agriculture for years. Dr. Martini left Italy before any decision was made and therefore he does not know which method was used or the effect on malaria.

Regarding malaria prophylaxis Dr. Martini believes 0.06 gm. atabrine daily, is the best. It will prevent about 2/3 of clinical cases but because of accumulation this will be reduced to about 1/2 in the course of a year.

Dr. Martini had a little experience with Gix in adult anopheles control in houses. He thinks the results were fairly good but tests were not conducted on a large scale because of the shortage of supplies.

He knows little about the effects of plasmochin in preventing relapses after atabrine but doubts that it has much effect.

Dr. Martini's age prevents him from taking any very active part in malaria research. He has no interest in other tropical diseases.

5. Dr. Albert Westphal

Cage No.9 Bad Kibling Prison Camp.

DIAGNOSIS OF LATENT MALARIA.

Dr. Westphal's method for diagnosing latent malaria depends upon a non-specific reaction, that is, the increase in euglobulins in the blood. On his nepholometer the readings for normal serum are about 10. Acute malaria about 100. After a cure of malaria the reading slowly falls to normal in about a month. In chronic malaria the reading remains high, i.e. 30-50 for months or years. His results are based upon a study of about 100 vivax cases and 3-4 falciparum cases.

The principle is as follows:- The patients euglobulin level is read first and compared with any normal serum. On this instrument, if the reading is much above 10 (i.e. 30 to 1000) this is evidence that some chronic disease is present. He then gives the patient a subcutaneous injection of 1 mg. of epinephrine to provoke malarial activity. Twenty-four hours later he starts atabrine treatment, 0.3 gm. daily for seven days. On the fourth day of atabrine treatment

(five days after the epinephrine injection) and again four days later euglobulin estimations are made. Two cubic centimeters of blood are with drawn from an arm-vein and the serum allowed to settle for about three hours (not less than one hour, not more than six hours) at room temperature, 20°C.

Then 0.1 cc. of serum is added to test tube A; 0.05 cc. to test tube B; and 0.02 cc. to test tube C. To tube B 0.05 cc. and to tube C 0.08 cc. normal saline is added. Double distilled water conteining 0.05 phenol is prepared. Then 2.5 cc. of this reagent is added to each tube. The final content of each tube is as follows:-

Tube A	serum 0.01 cc	reagent 2.5 cc.	
Tube B	serum 0.05 cc	saline 0.05 cc	reagent 2.5 cc.
Tube C	serum 0.02 cc	saline 0.08 cc	reagent 2.5 cc.

All tubes are allowed to stand at room temperature for about one hour - not less than forty minutes, not more than seventy-five minutes The tubes are all then read in a nepholometer. With Dr. Westphal's instrument the following readings are obtained:-

Normal young men	Tube A-10; tube B-0; tube C-0
Normal young women	Tube A-20-30; tube B 10-15; tube C-2-3
Malaria patient	Tube A 60; tube B 30; tube C-10

As the age of normal people increases the value rises. The reason for using three tubes is to get the most satisfactory amoung of precipitate for the instrument. If Tube A is used the euglobulin number is read off directly; if Tube B is ubed the reading is multiplied by 2; and, if Tube C is used it is multiplied by 5.

In normal persons the euglobulin level is low. In persons suffering from some chronic disease other than malaria, it may be high but it is not increased by epinephrine and atabrine. In acute malaria it may also be high but also here it is not increased by epinephrine and atabrine. Only in latent malaria is the euglobulin considerably higher after epinephrine and atabrine than it was initially. It is claimed that the test is positive even when parasites are not found in the blood after epinephrine. An adventage is that the atabrine prevents an attack of malaria after the test.

6. Professor Claus Schilling - Augsburg

7th Army Interrogation Centre

MALARIAL IMMUNITY

Professor Schilling was formerly Director of the Tropical Medicine Department of the Robert Koch Institute in Berlin. He is 74 years old and it was difficult to get a straight story from him.

During the war he carried out malaria experiments on the prisoners at Dachau concentration camp. These experiments were done on prisoners without their consent. Nine cases were given tertian malaria by sporozoit injection or by blood inoculation. Treatment was administered before symptoms appeared. This was repeated from 2 to 5 times when the patients were found to be immune - i.e. they did not have symptoms if the treatment was omitted. Three strains of tertian parasites were used - Ielmansee, Crete and Madagascar. There was cross immunity between the first two, but not with the Madagascar strain (it is much more virulent).

Then he conceived the idea of giving only one inoculation and controlling the temperature with pyramidon. The pyramidon had no effect upon the parasites. Up to 3 gm. of pyramidon were given daily for several weeks. It was tolerated "better than I expected", although there was a marked fall in white blood cells in all cases. Two patients died of "typhus". There was a fall of one million to two million red blood cells within 3 or 4 days after the first attack. He admits that these afebrile attacks of malaria were pretty hard on the patients general physical condition.

He is now working on parasite curves and can only say at this time the parasites did not get out of hand due to the developing immunity. He was taken to hospital on 12 March 1944, for a prostatectomy. On 14 March 1944 orders came from Berlin to destroy his records. His assistent however saved most of them.

He claims not to have known of the horrors of Dachau camp, but at a different time in the interrogation he mentioned that 5 % of the malaria patients treated by him (these were not subjects of experimentation) died of starvation or typhus.

He says that he and Dr. Neumann were able to prevent an attack of malaria after inoculation by the following procedure:- 4 cc of whole blood is withdrawn from the patient at the beginning of the febrile paroxysm and stored in ice. Then 16 cc of serum is withdrawn just before the next paroxysm. The two are mixed together and allowed to stand 1/2 hour and then injected into a susceptible individual. Blood alone caused malaria but never when mixed with serum - (Geitschrift für Immuniteits Forschung).

7. MACHINE UND FABRIKEN AUGSBURG UND NURNBURG

Chief Eng. Weber, located at Mainz - Weisnau
Former Chief eng. Rudolph Diesel.

This underground factory was begun in June 1944 and production was started on 3 October 1944 and stopped only when the Americans came. The factory is dug into the side of an old limestone quarry and consists of six entrance shafts parallel with the surface of the ground and connected by three shafts running at right angles. The shafts are 44 meters from the surface of the ground.

The cross or right angle tunnels are about 300 m. long and the total extent of the tunnels is about 1½ kilometers. There are some other small tunnels which are about 50 m. long and used for sleeping quarters, dining rooms, etc. The dimentions of the tunnels are 3½ m. wide by 3½ m. high. The ceilings are arched.

When operating the factory employed 300 to 400 people and was constantly being enlarged by miners. The machinery consisted of lathes, drills, punches, etc. Launching gear for robot bombs was made here as well as other equipment and machinery of a semi-military nature. For ventilation there were three vertical shafts on the ground level and one of the six entrance shafts was for air intake only. The air at the intake shaft was heated by steam and electricity in winter, and cooled by refrigeration apparatus in summer. No provision was made for controlling humidity although sometimes the air was so moist that condensation in the nature of a fog resulted. Water was supplied from the city mains and also from deep wells under the factory. The water was repeatedly examined by bacteriologists and chemists and found to be pure requiring no treatment. Electric current was from cross-country lines, but two diesel plants were provided for emergency use.

Sewage disposal was by seepage drain to septic tanks. The toilet facilities were of the usual German type, but were entirely inadequate for the number of people employed. There was a men's and women's toilet for office help of about three bowels each. For the factory help there were two men's toilet and two for women. In each case one for German and one for foreign labor. Each toilet room contained two stands with running water for hand washing.

It was not intended that workers should sleep in the factory but they did so after their homes were destroyed by air raids. Tunnels were set aside about 60-70 meters long housing 100 people in double-decker beds. Antivermin precautions were taken in the sleeping quarters.

The kitchen consisted of a large electric stove, six large electric and steam kettles for soup, and cupboards for crockery. The dining rooms were about 12 meters long and 50 people ate there at one time. According to Mr. Weber, they received potatoes, vegetables and bread twice daily. He said that the food was the same for foreigners and Germans but they ate in different dining rooms. Even eggs were given at times. Although he admitted that the food was inadequate, he said it was as good as all the other Germans received.

There was a small first aid room with an adjoining emergency room with two double-decker beds. The first aid room was fairly well equipped with the usual instruments, small sterilizer, dressings etc. There was an untraviolet lamp and each worker received 2-3 minutes treatment a day. Three nurses were in attendance and three doctors were on call. The factory worked 3 shifts of 8 hours each, although some workers worked 10 hours. They were given Sunday and half-day Saterday off every two weeks. There were no bathing facilities. The health was generally good. No excess of tuberculosis, industrial accidents or arthritic complaints over surface workers occurred. There were always 8-12 people with leg ulcers however. There were four fatal accidents; three due to a cave-in, and one from a machine falling during air raid excitment. The chief office was painted with phosphorescent paint for illumination both sides of the ceiling to prevent shadows.

The factory was medium in size for munition factories built artificially underground. There was no sabotage and workers preferred to work here rather than in surface factories. It was

planned to change workers every three months, but some stayed the entire time.

8. Professor Herman Eyer

Medical Research Institute, Krakau
under auspices of Army High Command
Interrogated at 7th Army Interrogation Center -
Augsberg

TYPHUS FEVER VACCINE

Professor Eyer was in charge of the production of typhus vaccine at the Institute at Krakau. While he has had experience with all three common methods of vaccine production - the louse method of Weigl; the Cox method, in which chicken egg yolk is used; and the mouse lung method - he prefers the louse method. Although he has had no direct clinical experience with the use of the three methods, he believes that the vaccine made from the bodies of lice is superior. On theoretical grounds he believes that this must be true since egg yolks, mouse lungs and mouse brains are not the natural habitat of the Richettsia prowazeki, and it must undergo adaptation in order to live in these hosts. In adapting themselves to this unnatural habitat the rickettsia lose much of their virulence. A second advantage in his opinion is that the louse vaccine is a palyvalent one made from 10 or 12 different strains of organisms isolated from different localities wheras the other two methods use only a single strain. Although it was not under his observation he thinks that the army experience at Warsaw demonstrated the superiority of the louse vaccine.

Regarding the effectiveness of the vaccine he has no data. His impression is that the mortality among all ages in the army was about 15 %. This is due to the fact that the vaccine used was not always potent and it was frequently given improperly under war conditions. In his own personal experience of about 300 cases of all ages up to 50 years there was no mortality. He thinks that when used properly the mortality of all ages should be less than 1 % in vaccinated individuals.

He believes that the best scheme of inoculation for the army is to give injections subcutaneously separated by intervals of from 4 to 7 days. The first inoculation contains all the rickettsia from five lice, the second from 10 lice and the third from 15 lice. This course should be repeated at least every nine months.

For the protection of people in his laboratory who were feeding the lice, he has a special intensive inoculation. The three inoculations are given as described above.

Three weeks after this course a reinforcing inoculation of the rickettsia from 100 lice is made. When infected lice are fed on people protected in this manner, only about 5% acquire the disease. In such people the fever reaches about the same height as in unprotected individuals but the clinical course is much milder, and of shorter duration. The mortality is nil. This mild attack confers a lasting immunity. Such people can be used to feed 10,000 infected lice daily without danger of another attack. Regardless of the strain of rickettsia which caused the attack they are immune to all strains.

Regarding the economics of the louse vaccine Professor Eyer has the following comments: His Institute produced from 100,000 to 200,000 doses of vaccine per month. It employed nearly 2,000 feeders, 50 of whom were Germans and the rest Poles. The feeding required only 30 minutes of the feeders time per day, so that he could be employed elsewhere. When one considers the caloric content of the food for the mice, used in making the mouse lung or mouse brain vaccine and the caloric content of the food for the chickens that lay the eggs for the egg yolk vaccine; the caloric content of the food for the humans that feed the lice is only about 1/8 or 1/10 that of the other two. He figures the cost of one inoculation of the louse vaccine to be 1.8 marks (at present rate of exchange 18 cents U.S.A.). Professor Eyer thinks that the danger to workers in making the louse vaccine while present is no greater than that incident to the other methods. In short, he says that most people engaged in the manufacture of typhus vaccine will acquire the disease eventually regardless of what method is used.

Professor Eyer has a quick method for the diagnosis of typhus which he says can be carried out reliably even by the inexperienced. Microscopic slides or strips of cellophane are prepared by placing a small drop of culture of B proteins strain ØX 19 at one end. The drop of culture is allowed to dry. These slides

are stored until needed for use.

At the time of using a drop of water containing a little methylene blue is placed over the drop of dried culture. When the culture is dissolved a drop of the blood to be tested is added. Agglutenation in positive cases takes place in less than a minute. The diagnosis is possible on the fifth day of the disease. The speed of the agglutenation is some rought indications of the titre of the serum under test.

Regarding treatment he thinks that there is no specific remedy of any value. He thinks chematherapy useless in all virus and rickettsial diseases. He believes that nursing, diet, and general measures are of utmost importance.

He succeeded in making an antiserum from sheep, but says that it was too costly and uncertain in its action.

Not long before his capture by the Americans he removed his laboratory to the village of Roth near Nuremburg in the Genesungsheim (Convalescent Home). His apperatus, strains of organisms and a large stock of partly processed vaccine are there. He is very anxious to return to Roth to continue his experiments.

TRENCH FEVER

Dr. Eyer has tried to make avaccine for Trench Fever (Wolhynean Fever) by the same method without success. He thinks that vaccines for trench fever are hopeless because the disease does not confer much immunity. This is evident from its chronic nature.

He has had no experience with Tsutsugamuschi disease but says that a Chinese by the name of Chung working in China was successful in making a vaccine for Tsutsugamuschi disease by this method. He believes that Chung used lice and not mites in which to grow the Rickettsia orientalis.

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9. Dr. Heinrich Mückter

Medical Research Institute - Krakau
Interrogated at 7th Army Interrogation Center - Augsberg

TYPHUS FEVER VACCINE

From Dr. Mückter was obtained the technic of preparation of typhus vaccine by the louse method. Only lice reared in the laboratory and known to be free of disease are used.

Lice are fed only on human blood. If allowed to bite any other animal, they die in about two days. This is probably due to a different configuration of the hemaglobin crystals in human and animal blood. The lice are infected 14 days after hatching by the following method: Ten lice dead of typhus are dissected and the guts ground up and suspended in saline. The lice are then inoculated by injecting a small amount of this saline suspension into the rectum by means of a capillary pipette. One trained technician with a trained assistant can inoculate nearly 1,000 lice an hour.

All lice both before and after inoculation are fed on human beings daily, 10,000 lice may be fed on a single person daily. The time required is about 30 minutes. 10,000 lice take about 10 cc of blood at a feeding.

Five or six days after inoculation the lice die of the disease. They are then dissected and the guts removed. Rickettsia are present in the guts, in the feces of the louse and in the saline in which the dissection is made. The guts are ground in a morter and suspended in saline to which is added 0.5 % phenol and 0.2 % formalin. The same treatment is given the suspension of feces and the saline in which the dissections were made, but the three portions are kept separate. The three suspensions are kept at 4°C for two days and then at 25°C for the remaining time until the suspensions are sterile. The gut suspension becomes sterile in five days and the feces and saline from the dissection in about 15 days. Sterility is tested by the usual bacterial culture methods. When the three suspensions are sterile they are mixed

together. The rickettsia from 1,000 lice are suspended in 2 cc of physiological saline. This concentrate, 1 cc of which contains the rickettsia of 500 lice, is then diluted so that 1 cc of saline contains the rickettsia of 30 lice. One sixth of this suspension is isolated and further diluted with saline to 1 cc and ampuled. This is the first dose of vaccine and contains the rickettsia of five lice.

Two sixths of the suspension is then isolated and diluted to 1 cc and ampuled. This is the second dose of vaccine and contains the rickettsia of 10 lice. Three sixths of the suspension is then diluted to 1 cc and ampuled. This is the third dose of vaccine and contains the rickettsia of 15 lice.

A complete series of inoculations for one person is derived from 30 infected lice. The dissections are done by experienced technicians, each with a helper. One such team of two people can dissect between 1,200 and 2,000 lice in two hours.

The vaccine is injected subcutaneously and is generally well tolerated producing no pain, swelling or fever, except in occasional sensitive individuals.

There were three sources of typhus vaccine on which the Wehrmacht depended. The Behring Institute at Marburg which produced egg yolk vaccine; an Institute at Lemberg which produced both lice and egg yolk vaccine and, the Institute at Prakau which produced only lice vaccine. The German army however, depended mostly on the louse vaccine for protection from typhus.

10. Professor Dr. Freidrich Platner

Professor of Physiology at the following Universities at different times - Innesbruck, Konigsburg and Vienna.

Interrogated at 7th Army Interrogation Center - Augsberg.

DARK ADAPATION

At one time Professor Plattner held a fellowship from the Rockefeller Foundation and worked with Starling in London.

During the war he was asked by the Luftwaffe to carry out investigations on night vision with a view to determing at the outset whether a candidate was a fit subject for such an occupation as night-flying, the operation of search lights and for sighting and firing anti-aircraft guns. His approach to the problem was to ask the Luftwaffe for three groups of men of about 80 men each.

Group I was to be composed of men who had proven themselves highly efficient at such occupations; Group II was to be average and, Group III was to be composed of those whom the Luftwaffe itself had found performed poorly at such tasks.

Professor Plattner then carried out dark adaptation tests on all these subjects, using the usual methods and technics. He then classified the men into three groups according to the outcome of the tests. There was fairly good correlation between his grouping of the men on the basis of the dark adaptation test and the grouping of the Luftwaffe based on actual performance. There were enough cases in which the two groupings did not coincide however, to make Professor Plattner believe that present methods could be improved.

Since the response of a muscle or a nerve to stimulation depends upon two factors - the strength of the stimulus and the duration of the stimulus, he considered that perhaps time or duration should be brought into the test.

He then perfected an apparatus based upon the pendulum principle whereby the duration of a light stimulus could be controlled accurately down to the thousandth part of a second. At the same time the intensity of the light stimulus could be measured and controlled. When the two components were tested separately by holding one constant and varying the other and then reversing the procedure, he found that when plotted the curve was a hyperbole.

In making his tests his subjects were kept in a room with standard lighting controlled by a photoelectric cell for 10 minutes. They were then placed in the dark room and tested for dark adaptation at intervals of two minutes. He found that practically complete dark adaptation took place in 40 minutes, but slight improvement in vision continued to occur for hours. The end of the war interrupted his work and he cannot evaluate with certainty the importance of the time factor in dark adaptation tests, but he believes that it may account for the decrepency in grouping people on the basis of performance and on the results of the dark adaptation test.

So far his studies show that there is no significant difference between the sexes in dark adaptation.

In women during the menstrual period, if there is any difference at all it is very slight.

The physical conditions of the subject is of great importance. Even a slight cold in the head will cause marked fluctuations in the curve.

An excess of vitamin A or caroten causes no improvement in persons who are not vitamin A deficient.

The learning effect is important and will introduce an error if not taken into consideration. That is, people learn to perceive light of less intensity or shorter duration with practice up to about five tests when they hit a plateau, and there is no further improvement by learning.

Age raises the threashold for light intensity perception but has no effect on the duration factor.

The extract of hog retina prepared by a German pharmaceutical company had no effect on dark adaptation either when instilled into the eye or injected subcutaneously into normal individuals. This extract did improve adaptation however, when given to vitamin A deficient individuals.

Vitamin A tablets were given to night fighters of the Luftwaffe, not with the hope of improving night vision above normal, but to prevent deterioration in night vision by vitamin A deficiency.

German night fighters objected to being kept in the red room because it interferred with their card playing. In order to overcome this objection Dr. Plattner tried covering only one eye with a pad, allowing the other eye to remain unprotected. He found that dark adaptation occurred only in the covered eye. There was no transference of adaptation from the covered eye to the uncovered one. When the pad is first removed from the one eye, however, the subject experiences a peculiar and rather unpleasant sensation of two kinds of vision. It was described by the fliers as "like being cut in two with both halves able to see" or "its like being two people and looking at the same thing". This sensation, however, lasted for only about five minutes then the subject learned to disregard the imperfect image in the unadapted eye and to rely on the perfect image of the adapted eye. Some flying officers liked the method and continued to use it - others gave it up.

AFTER IMAGE

Some minor experiments on the effects of drugs on the after image were done. It is well known that fatigue increases the duration of the after image. Pervatin (a stimulent like benzidrin) shortens the duration of the after image and sedatives increase the duration.

REGENERATION OF NERVES

Some animal experiments were carried out on the effects of electric stimulation on the regeneration of nerves after crushing with a clamp. Both the distal portions of the crushed nerve and the central portion were stimulated by both alternating and direct current. The results were evaluated by histological examination. It was concluded that electric stimulation however applied had no effect on the regeneration of nerve tissue.

11. Brig. General Kurt Hoffman

Chief Medical Officer, German Police Force
Interrogated at 7th Army Interrogation Center -
Augsberg.

ORGANIZATION OF POLICE MEDICAL DEPARTMENT.

General Hoffman is an administrator and has never done any medical research. The organization of the Medical Department of the Police force is as follows:-

The chief of the Medical Service in Berlin is responsible for policy and for appointment of local medical officers. Each large city or rural township had a chief local medical police officer who had a varying number of assistants, depending upon the size of the city or township. These officers were drafted from among the local physicians. In a city the size of Hamburg for example, there were 30 or 40 stations. Three physicians were assigned to each station and there was one physician on duty at each station at all times. When off duty the physicians were allowed to attend to their practices. During air raids all three physicians were required to by on duty.

All policemen were given some first aid training. The function of the police medical department was to give first aid, to assign patients to hospitals, and to see that strethher and ambulance transport was supplied. They had no responsibility for the after care of casualties. This was done by civilian physicians, clinics and hospitals. In addition, the Luftwaffe had a somewhat similar set-up with overlapping responsibilities. There was a tendency as the war progressed for the Luftwaffe to relinquish this work to the Police Department however. (The Luftwaffe seemed to have a curious sense of responsibility inflicted on it by Allied bombers which penetrated the Luftwaffe's protective screen of fighters. Even the physicians attached to the Police Department for air raid duty wore Luftwaffe uniforms but with police insignia).

12. Dr. Samuel Müller - Director
Dr. F. Hairle - Assistant
Dr. Karl Herr - Assistant
Tübingen

TROPENGENESUNGSHEIM
(Tropical Convalescent Home)

The Tropengenesungsheim is a beautiful little hospital of about 100 beds operated by the Evangelical Society for the treatment

of missionaries returned from foreign fields. It has a separate small hospital for the care and treatment of missionary children. The hospital is well situated, well equipped but poorly staffed from a scientific standpoint. Dr. Müller and his assistants are undoubedly well qualified clinical practioners, but they have no originality or interest in research. They use only standard methods and never try anything until it has been well proven by others. The only diseases encountered in any number in the hospital are malaria and dysentery (amoebic).

Dr. Müller believes that the size of the infecting dose of sporozoites determines the number of relapses in vivax malaria. He believes that the relapse rate in vivax malaria may be materially reduced by the following regime: Atabrine 0.3 gm. daily for three or four days and then, chinoplasmin 3 tablets (total quinine 1.0 gm. plasmochin 0.15 gm.) daily for 21 days.

For amoebic dysentery he uses Entero-vioform-Ciba in the following manner:-

1st day	0.5 gm.	in	200 cc.	water	by	enema
2nd day	1.0 gm.	"	300 cc.	"	"	"
3rd day)	1.5 gm.	"	300 cc.	"	"	"
4th day)						
5th day)	1.5 gm.	"	400 cc.	"	"	"
6th day)						
7th day	1.5 gm.	"	500 cc.	"	"	"

At the same time this treatment is being carried out, 1.0 gm. of vioform is given orally three times daily. The oral treatment is continued for a total of 10 to 14 days. Emetine is given only for liver complications. Dr. Müller believes that vioform is better tolerated and more active than Yatren.

Malta fever, Schistosomiasis and Kala azar were also discussed without profit to the interrogator.

13. Professor Otto Stickl

Hygienesches Institut

EBERHARD: KARLS UNIVERSITAT - TUBINGEN

Professor Stickl has been interrogated by 17 individuals (not singly but in groups) previously and has given a complete account of this work to an American team. Consequently he was not interrogated in detail, but his recent work was discussed only in general terms. His major work has been the testing of sulfonamide compounds and investigations on the mode of action of sulfonamido compounds.

Among others he has tested Professor Kuhm's dibrom-salicyl. He finds it active on gram positive organisms, but not in tubercle infections. He says that the compound is far too toxic for clinical use and has abandoned work with it.

14. Dr. Willy Usadel

Professor of Surgery - Eberhard-Karls Universität Tübingen

KUNTSCHER METHOD FOR BONE FRACTURES

Dr. Usadel has used the needle technic of Kunstler for fixation of fractured long bones. He demonstrated the instruments and their method of use and showed X-ray plates of the results obtained. He is much more conservative about the method than other investigators that have been interrogated. He has used the method on about 10 cases only, and believes that it should only be used in cases where the ordinary means of reduction have failed.

He thinks that the chief danger is from fat embolism and says that while it has not occurred in his experience, he knows that it happens in about 2 % of larger series. He believes the method unsuited for use in gun shot fractures or in compound fractures where

there is much likelihood of infection developing. He confirms the fact that in fractures of the bones of the leg, if the needle fits snugly it is possible for the patient to walk without harm or pain in 8 or 10 days after reduction, but says that usually it is better to keep the patient in bed for one or two months. He says that the bone marrow regenerates rapidly after removal of the needle and that no harm results to the patient fromthis cause. He says that the special steel used (made by Krupp) causes no foreign-body reaction.

15. Dr. Hans Hermann Bennhold (Internist)

Eberhard Karls Universität - Tübingen

SERUM-PROTEINS

Dr. Bennhold's present interest is a continuation and elaboration of his studies on the function of the serum-proteins. He believes that the serum proteins act as vehicles for the transport of a host of substances in much the same way as the red-blood corpuscles transport oxygen. He calculates that the total surface of the colloidal particles of the serum proteins in a human being aggregate 450,000 sq. meters, and that substances are absorbed on the surface of the particles. His major work has been published in book form and is freely available.

16. Dr. Franz Knoop

Professor of Physiological Chemistry
Eberhard-Karls Universität - Tübingen

Professor Knoop was visited because of his outstanding position in the scientific world. He is 76 years old and no longer very active, although keenly interested in his surroundings. The discussion was general in nature and no information of value was

obtained.

17. Dr. Butenandt

Hygenisches Institute - Tübingen

INSECT ATTRACTANTS

For the past few years one of the chief interests of this great investigator has been the study of insect attractants. As experimental animals he uses the ordinary silk worm. After emerging from the cocoon the male silk worm is very sluggish and remains quiescent until stimulated to activity by a secretion of a small gland of the female silk worm. When stimulated by this substance the antennae of the male are lifted to an upright position and vibrate. With slightly more stimulation the wings flutter and the silk worm walks toward the source of the stimulation. Dr. Butenandt has succeeded in isolating and purifying this attractant substance secreted by the female and finds it to be a fat soluble alcohol free of nitrogen. The most satisfactory salvent is petrol ether. The tip of a glass rod touched to the surface of a solution of 0.01 gamma in 1cc will attract the male silk worm from a distance of several inches.

Dr. Butenandt believes that only 1 or 2 molecules of the substance are required to stimulate the male worm, although he does not know the molecular weight of the substance. The substance is absolutely specific for the silk worm, and has no effect on other species of insects tested. He believes, however, that other insects use substances of similar chemical nature and that when the chemistry of this substance is worked out, perhaps only minor modifications may be necessary to produce compounds active on other species of insects.

Dr. Butenandt's greatest handicap is the difficulty in obtaining sufficient female silk worms for his studies. He thinks with 100,000 silk worms he could prepare enough material

to clear up the chemistry of the compound. Dr. Butinandt believes that this substance is, from the physiologic standpoint, one of the most active compounds known.

PIGMENT OF FRUIT FLIES

Dr. Butenandt has also worked on fruit flies (Drasofia). One race of these flies has dark skin and eyes, while another race lacks this pigment. This pigment is carried by a single gene. However, an extract of the colored race injected into the race without color renders the latter indistinguishable from the former.

CARCINOGENIC STUDIES

Dr. Butenandt has also carried out studies on the carcinogenetic properties of the female sex hormone and diethylstilbesteral. He finds that both compounds are capable of provoking carcinoma in strains of white mice which have the tendency toward carcinoma, but not in other strains.

18. Professor Richard Kuhn

Hygenisches Institute - Heidelberg.

DIBROM SALICYL

The guards at the Hygienisches Institute refused to honor the 7th Army passes because they had been instructed by some major to admit none who did not have a special pass signed by him. Professor Kuhn did however, come out on the steps of the Institute where he was interrogated briefly.

He was told of the findings at Elberfeld that dibromsalicyl was inactive in tuberculosis infections. He admitted that the preparation had only weak activity against tuberculosis. He was then told that Professor Stickl had reported that the substance was too toxic for use. Professor Kuhn explained this by saying that Professor Stickl had used a boric acid combination of dibromsalicyl and that this was quite toxic. The boric acid preparation had been made in order to have a soluble substance suitable for parenteral use. Professor Kuhn then offered the information that

dibrom salicyl is suitable only for oral and local use - not parenteral.

Dr. Kuhn believes that dibrom salicyl is quite active in staphlococcus infections, but has not compared it with sulfathiazal directly. He says that it is effective in sulfonamide fast staphococcus and gonococcus infections. He believes it has some activity in amoebic infections but thinks that it is inferior to morfanil in this respect. When used locally for wounds it should be diluted 10 parts of dibrom salicyl powder to 90 parts sulfanilamide. He thinks it may be useful as a local treatment for gonorrhaea.

He says that dibrom salicyl has promise for the treatment of virus infections. Of 10 mice infected intrapetuoneally with influenza virus and treated with dibrom salicyl orally, all recovered. Of 10 control mice receiving no treatment, all died.

In view of the unfavorable circumstances of the interview and also because Professor Kuhn has been interrogated many times previously by other teams, it was not considered advisable to go more deeply into details of this work.

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